Cover Stories:

Major Scientific Publications Featuring NRI-funded Research

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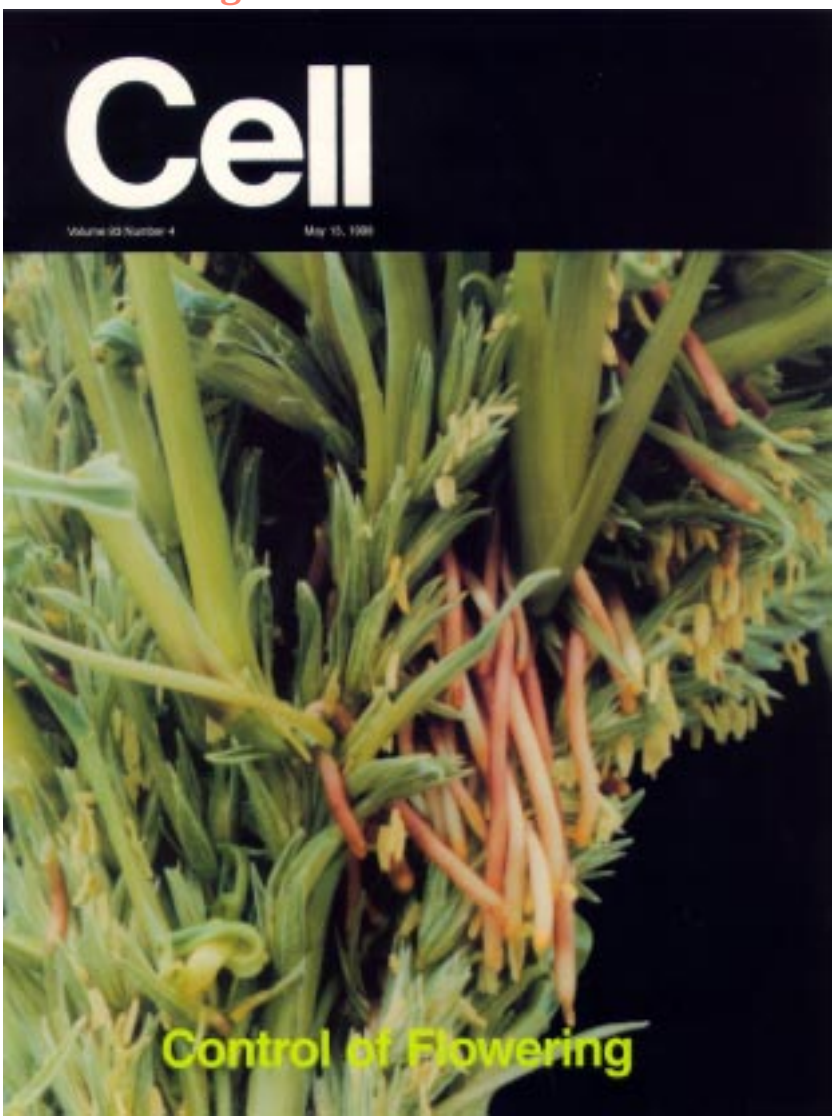

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Colasanti, Joseph, Zhuang Yuan, and Venkatesan Sundaresan. 1998. The indeterminate gene encodes a zinc finger protein and regulates a leaf-generated signal required for the transition to flowering in maize. Cell 93: 593-603.

The mechanisms behind flowering long have been a mystery to plant developmental biologists and physiologists. Whether plant buds develop into new shoots (vegetative growth) or into flowers (reproductive growth) is a consequence of either environmental or genetic signals, or both. Plants exhibit both incremental but relatively continuous growth (indeterminate) and determinate growth in which a shoot ends in a flower bud and stops growing. In corn, the ability to switch from indeterminate (vegetative) to determinate (reproductive) growth is controlled by the *indeterminate1* gene (*id1*); corn plants with mutations in this gene are unable to flower. Colasanti and Sundaresan used NRI funding to clone, characterize and analyze the expression of *id1*. They found that this gene codes for a protein with zinc finger motifs (finger-like projections containing a centrally located zinc atom). Zinc finger motifs have been associated with "switches" in plants and animals. It is likely that the *id1* gene functions as a regulator by switching the plant from vegetative to reproductive growth. Colasanti and Sundaresan also found that *id1* is expressed only in immature corn leaves and not in the shoot apex (tip). These findings support classical physiological studies that stipulate flowering is controlled by a flower-inducing and/or flower-inhibiting hormone-like substance (sometimes called 'florigen') that is transported to the apex from the leaves. The *id1* gene may act in leaves to regulate the production of this flower-inducing substance. This research has brought us a step closer to understanding control and regulation of flower development.

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